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SUGGESTIONS FOR PLANNING
FRUIT AND VEGETABLE PLANTINGS
FOR
RURAL RESETTLEMENT PROJECTS

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UNITED STATES DEPARTMENT OF AGRICULTURE
RESETTLEMENT ADMINISTRATION
WASHINGTON

March 10, 1937

Dear Sir:

You will find herewith a discussion of the planning of horticultural crops, under the title "Suggestions for Planning Fruit and Vegetable Plantings for Rural Resettlement Projects".

The purpose of the discussion is to aid the field personnel of the Rural Resettlement Division in so planning the fruit and vegetable phase of the projects as to make the greatest possible contribution to the economic security and to the health of the resettled families.

This material was prepared in the Economic and Social Section. Copies should be distributed to project managers, farm management men, home economists, and others who are concerned with this phase of project planning.

Sincerely yours,

WALTER E. PACKARD
Director
Rural Resettlement Division

MAR 5 1946

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SUGGESTIONS FOR PLANNING FRUIT AND VEGETABLE PLANTINGS
FOR
RURAL RESETTLEMENT PROJECTS

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SUGGESTIONS FOR PLANNING FRUIT AND VEGETABLE PLANTINGS
FOR
RURAL RESETTLEMENT PROJECTS
Hugh Ross, Horticulturist
Economic and Social Section

1 CHOOSING FRUIT AND VEGETABLE CROPS FOR THE FAMILY FOOD SUPPLY.

The choice of crops to be grown will be based, insofar as possible, on the following considerations:

a General Considerations.

- I Dependability of Crop. The crop must be fairly dependable as to yield, under conditions as they exist in the project area. This involves adaptability to soil and climate and the ability to survive insect and disease attacks where reasonable control measures are used. Dependable production does not necessarily imply a commercially profitable crop in order to be worthy of planting for home use.
- II Seasonal Distribution of Products. Fruits and vegetables should be chosen which mature successively throughout the season, in order to provide as long and continuous a supply of fresh foods as possible.
- III Family Diet Requirements and Preferences.
 - A Importance of the Diet. Two of the most important objectives of the resettlement program are (1) the achievement of economic stability and security for the resettled families, and (2) the maintenance of high health standards. Each of these objectives is dependent on the other. In our past agricultural experience as a nation, an ample supply of home-grown foods for the family has proved to be absolutely necessary in attaining economic security and high health standards.
 - B A Few Food Facts. Following are some salient facts about vegetables and fruits which all project managers and farm management men should know. (A home economist may not always be available.)

Vegetables and fruits are important in the diet chiefly because of their vitamins, minerals and indigestible residue. In addition, some of them supply substantial quantities of carbohydrates, fats and proteins. They are also valued highly because of their distinctive flavors, textures, and colors. Leafy, green and yellow colored vegetables, tomatoes and citrus fruits are among those especially valuable for their vitamin A and iron, and they also contain vitamin G.

The green leafy vegetables and other green and yellow ones should be frequently included in the diet. All vegetables and fruits contain some vitamin B. For vitamin C, tomatoes, citrus fruits, raw cabbage and raw turnips are important. (See U. S. Dept. of Agri. Farmers' Bulletin 1757, "Diet to Fit Family Income", and Field Instruction RS-11, pages 11 - 14, section 5, Use and Preparation of "Budget for Food and Fuel Furnished by Farm".)

A liberal diet in fruits and vegetables should be the ultimate aim on all Rural Resettlement farms. This means 6 or 7 servings daily per person, made up of the following:

- 1 serving daily of potatoes or sweet potatoes.
- 1 serving daily of tomatoes or citrus fruits.
- 2½ - 3 servings daily of vegetables at least one-half of which are leafy, green or yellow.
- 9 - 10 servings per week of fruit.

The amount of dried vegetables should be considered in relation to meat and eggs available because of the presence of vegetable protein. Tree fruits, on many farms, will not be available for 3 to 5 years, as it takes that long for them to mature.

Further reference to the matter of planning to meet diet requirements will be made under the general heading "Steps in Planning a Fruit and Vegetable Program".

IV Coordination of Food Crops With the Rest of the Farm Management Plan. The growing of a sufficient quantity and variety of food crops necessarily requires labor which the farmer and his family might otherwise devote to cash crops. The proper balance between food crops and cash enterprises will result only if the planners as well as the farmers appreciate their relative importance.

The farm and home plans must be so worked out that the farm family will be able to take proper care of both the production and preservation of their food supply and the necessary cash enterprises of the farm. All feasible alternatives should be considered, in case of conflict, for example (a) shifting the planting and harvesting dates of certain crops to distribute the labor load, and (b) increasing the number of kinds, the quantities, and the distribution of small fruits and fruit-type vegetables to meet the diet needs where tree fruits are not practicable, or where young orchards will not come into bearing for several years. The two adjustments suggested are typical of others which may be necessary on certain projects and units.

b Additional Points in Selecting Fruits to be Planted.

In addition to the general considerations discussed above, certain special factors enter into the selection of kinds and varieties of fruit for home planting.

- I Drainage - Soil and Air. Tree fruits especially need a deep, well drained soil and good air drainage. Where either soil or air drainage is deficient, tree fruit plantings should be kept to a minimum, or eliminated from plans.
- II Varietal Adaptability. Varieties of fruits should be chosen with reference to:
 - A Adaptability to local conditions generally, such as soil and climate. Varieties that are superior in some localities may be inferior in others.
 - B Resistance to Diseases. Some varieties of apples and other fruits have shown a relatively greater resistance to certain diseases than have other varieties. Although growers must still depend largely upon an efficient spray program for the control of fruit diseases, a larger yield of usable or marketable fruit, and a better quality of fruit, may be obtained by selecting the more disease resistant varieties and avoiding the more susceptible ones.
 - C Pollination. Many varieties of fruits are not self-fruitful. Self-fruitful varieties should be used or satisfactory pollenizing varieties planted near the self-unfruitful sorts.
 - D Time of maturity and duration of harvest. A desirable succession of fruits may be arranged by selecting varieties that ripen successively over a long period of time.
 - E Quality for home use. This involves:
 - (1) High edible quality in fresh condition.
 - (2) Suitable canning quality, if to be canned.
 - (3) Good keeping qualities under farm storage conditions, if to be stored.

(See U. S. Dept. of Agri. Farmers' Bulletin 1001 "Growing Fruit for Home Use", Farmers' Bulletin 1242 "Permanent Fruit and Vegetable Gardens", also bulletins and circulars on individual crops.)

c Additional Points in Selecting Vegetables to be Planted.

Most of the considerations in the proper selection of vegetable crops are covered under the heading "General Considerations". The most important additional factor is:

I Varietal Adaptability. Varieties should be chosen with reference to their:

- A Adaptability to local soil and climatic conditions.
- B Resistance to diseases.
- C Time of maturity and duration of harvest period.
- D Quality for home use.

(See United States Department of Agriculture Farmers' Bulletin 1673 "The Farm Garden", Farmers' Bulletin 1746 "Subsistence, Farm Gardens", also bulletins and circulars on the individual crops.)

2 COMMERCIAL PLANTINGS OF FRUITS AND VEGETABLES, -SPECIAL CONSIDERATIONS IN SELECTING THEM

The general conditions for the production of fruits and vegetables commercially are the same as for the growing of the same crops for home use except that more capital is generally required for buildings, equipment, supplies and labor, and that a profitable market must be found for the products. Before planting substantial quantities of fruits or vegetables, or before constructing units which apparently can be amortized only by growing such crops, the following general facts must have been determined, along with related details.

a Production Factors to be Determined.

- I The fruit or vegetable in question must be known to produce reasonably dependable crops under the conditions existing on the project area.
- II The crop must fit in with the other enterprises in the farm management plan, and must not conflict with other crops in peak labor periods such as planting and harvesting time.
- III An adequate labor supply for the proper production, harvesting and handling of the crop must be assured.
- IV The investment in special buildings, equipment, supplies or other costs necessary to the successful production and handling of the crop must be known and justified by conservatively estimated returns.
- V Total production cost per acre and per unit produced. Care must be exercised in applying cost figures from farm management studies or other sources to resettlement projects. Probably the most useful figure will be the direct cash cost of a crop. In this case the operator's labor and family labor will

be eliminated, as well as such items as interest, use of land and machinery and depreciation. Labor rates for hired work must be checked, also the cost of supplies used in producing the crop.

b Marketing Factors to be Determined.

Definite market outlets must be reasonably certain in which products from the project area under consideration can compete successfully with the products from other areas.

I Possible Market Outlets, Capacities and Prices.

A Fresh fruit and Vegetable Markets, such as, (1) shipping to large distant markets; (2) hauling to nearby municipal or other markets; and (3) roadside marketing.

B Processing Plants, such as, (1) canneries; (2) driers; (3) freezing plants; (4) juice plants; and (5) pickle factories.

(See U. S. Dept. of Agri. Miscellaneous Publication No. 150 "Bibliography on the Marketing of Agricultural Products".)

II Marketing Costs and Competition. Transportation and selling charges involved in marketing the produce must be known and should be compared, if possible, with the costs of marketing produce from competing areas, to determine the probability of survival of the enterprise. Lower production costs in competing areas (resulting from lower wage scales, lower land values, etc.,) may offset higher shipping costs.

3 STEPS IN PLANNING A FRUIT AND VEGETABLE PROGRAM

a General Planning. The following suggested steps in planning apply to the fruit and vegetable program as a whole.

I Seasonal Distribution of Fresh and Stored Farm-Produced Foods. (Form RA-RS-25) Fill out this form carefully for the project as a whole, according to Field Instruction RS-11, unless this already has been done. If the form has been prepared, check it carefully to see that all desired products which can be produced economically have been listed, and that all crops which have serious drawbacks in the light of local conditions have been excluded. Have the completed form checked by the fruit and vegetable specialists of the State College of Agriculture. This may be called the "master" seasonal distribution chart for the project.

When interviewing a client and his wife for the purpose of making a farm and home plan, the following procedure is suggested:

- A List on blank forms RA-RS-25 all of the food crops which the family will grow, selecting the crops from the "master" RA-RS-25 for the project, and grouping them by diet classes, as on the "master" form.
- B Fill in the seasonal distribution lines for each crop (showing fresh and storage periods in separate colors or solid and broken lines), copying this material from the "master" RA-RS-25.
- C Check the continuity of supply of foods in each diet class or group (such as "leafy, green and yellow vegetables"), and point out to the family how any existing gaps may be filled in by adding certain vegetables or fruits or certain additional varieties which mature at that time. With their cooperation fill in the necessary additional crops or varieties. This will comprise the seasonal distribution chart for the family.

II Quantities of Fruits and Vegetables to be Produced.

The total amount required in the diet for each vegetable and fruit group (such as leafy, green and yellow vegetables) has been calculated by the home economist on the form "Plan for Food and Fuel". With this as a basis, she should determine the quantity of each vegetable and fruit listed on the family seasonal distribution chart, which the family can use advantageously during the year, and place these figures in the proper spaces on the form "Plan for Food and Fuel".

The bases for determining the quantities of each fruit and vegetable to be produced will be chiefly the family preference for the various foods, and the length of time it is possible to have them available either fresh, from storage, or from a canned supply.

The amount of canning necessary to insure a proper food supply may be kept to a minimum by taking full advantage of the growing season in planning the garden, by irrigating where it is necessary and feasible, and by providing satisfactory storage for as many as possible of the vegetables and fruits that may be stored without canning.

III Detailed Plans for Producing Fruits and Vegetables for Home Use.

In this planning, the following data should be tabulated: Crops to be grown, amounts of each to be produced (from the form "Plan for Food and Fuel"), varieties, numbers of plants or number of feet of row, quantities of seeds, planting distances, normal harvesting dates, and estimated yields. Plantings of each crop should be ample to allow a reasonable margin of safety to cover losses from weather, insects and diseases, or other causes.

A form for tabulating this material, entitled "Garden Planting Plan", partly filled out for purposes of illustration, is enclosed herewith. Such a form, when completed for and with a family, will serve as a guide to their entire season's food production. From it the proper amounts and kinds of seeds will be ordered, the correct amount of hotbed space or other facilities for growing plants will be figured, and the various plantings and transplantings may be made at the right time, with necessary variations for the weather.

Garden bulletins from the state college of agriculture, and such bulletins as Farmers' Bulletins 1673 "The Farm Garden", and 1733 "Planning A Subsistence Homestead" give tabulated data which will aid in preparing the above-mentioned form.

A detailed plat of the garden probably is not necessary in every case, but may be very useful to some families in planning the space required for various plantings. Others may do a very good job without a plat of the garden, using only the "Garden Planting Plan", supplemented by a good garden bulletin giving cultural information, suggestions as to arrangement, and other details.

In all cases, the relatively permanent plantings, including tree fruits, small fruits and perennial vegetables should be located with the aid or under the supervision of the farm management man, the county agricultural agent, or a horticultural specialist.

IV Soil Examination and Treatment.

Assuming that the farmstead site has been selected with due regard for quality of soil for garden and orchard use, as well as for other factors, the condition of the soil available for the garden and orchard should be determined and the proper treatment of the soil planned.

A Examination of Soils. The main factors which combine to make up the productiveness or "fertility" of the soil should be carefully checked. These are:

- (1) Character and depth of surface soil and sub-soil, including drainage and water retaining capacity,
- (2) Physical condition of the soil, especially as affected by past treatment, and as subject to correction,
- (3) Condition as to weed infestation, and
- (4) Chemical condition. In some cases the only type of test needed may be a test of the acidity of the soil; in others, rapid field tests for the principal plant food elements may be desirable.

- B Soil Treatments. The treatments of garden and orchard soils which may be required to make them satisfactorily productive should be those which are recommended by local and state agricultural authorities for the existing conditions.

In acid-soil areas, it is recommended that special attention be given to liming for vegetable crops. The fact is often overlooked that many vegetables, including asparagus, cabbage and most of its relatives, lettuce, beets, carrots, spinach onions, peppers and celery thrive best in a soil with a nearly neutral or only slightly acid reaction, and that certain other crops including potatoes, sweet potatoes, tomatoes, watermelons and strawberries usually do better under moderately acid conditions. The amounts of lime to apply to different areas on which certain groups of crops are to be grown should be based on actual soil tests.

- V Irrigation. On many projects the irrigation of orchards and gardens is definitely either necessary or not necessary. In other areas there may be a question as to whether provision should be made for irrigation to supplement natural rainfall, especially in the case of the more shallow-rooted vegetables and small fruits. In considering this matter, the principal criterion should be the effects on the family living budget and on the family health which may result from food shortages caused by drouths, and not the farm value of the products lost.

Average rainfall figures do not form a satisfactory basis for deciding whether irrigation is necessary. A study of monthly rainfall for several years will reveal the extremes which tell the real story as to drouth.

A discussion of "supplemental" irrigation was presented in, letter from W. E. Packard, Director, Rural Resettlement Division, to all regional directors, under date of October 31, 1936, and in a four-page enclosure entitled "Supplemental Irrigation for Home Gardens on Rural Resettlement Projects". Copies of this enclosure may be obtained from the Economic and Social Section, Rural Resettlement Division, Washington, if they are not available in regional offices.

- VI Food Storage. A definite decision should be reached as early as possible in regard to the kind and extent of the storage facilities which it will be practicable to provide on a given farm, for fruits and vegetables as well as other foods. As mentioned in section II, page 6, the better the storage facilities, the less canning will be required. Plantings should be planned in relation to storage facilities as well as to other factors.

It will be impossible, on many farms, to provide ideal storage conditions for all of the various foods to be stored. A large number of foods may be kept in good condition if two general types of storage are provided.

- A A cool moist place, with controlled ventilation, for potatoes, root crops, apples, cabbage, etc. This may be a basement, outside root cellar, or temporary pit. Must be protected from freezing temperatures.
- B A dry insulated room with controlled ventilation, for sweet potatoes, onions, pumpkins, squash, canned foods, and other products. The temperature of this room should be adjusted as nearly as possible to the requirements of the most important foods stored in it. Probably 50° to 55° F. will be a suitable winter temperature. In summer, the insulation, together with judicious control of ventilation, will help to avoid too high temperatures.

VII Budgets for Equipment and Supplies.

- A Equipment and nursery stock. This will include special equipment in addition to that needed for general farm operations, such as sprayer or duster, pruning shears, hotbed sash and garden tools. Care must be used in selecting equipment that is adequate and adapted to the job to be done. For example, a wheelbarrow type of sprayer will take care of vegetable crops, small fruits, and a few fruit trees, if equipped with suitable hose, rods and nozzles, and is a much better investment than the inadequate little bucket sprayers or compressed air sprayers so often purchased. For cooperative spraying, a barrel sprayer or possibly a small power outfit may be required.
- B Annual Supplies. This list will include seeds, plants, spraying or dusting materials, see-treating and soil-disinfecting materials, and other supplies. Estimates should be based on approved varieties and practices necessary to produce the desired quantity, quality, and distribution of foods. Prices should be high enough to secure good quality seeds and other supplies, and should be based on cooperative wholesale purchasing.

VIII Supervision of the Resettled Family. A practical plan of supervision must be worked out for the purpose of assisting clients to accomplish the purposes set up in the farm and home management plan. This plan of supervision should make proper use of extension and vocational teaching services as well as project personnel.

It is suggested that a master calendar of operations be prepared and kept in the project office, so that clients may be advised and reminded in ample time of the need for doing certain seeding, prun-

ing, spraying and other operations at the right time, and that such instruction be provided, where needed, as will insure new and unfamiliar operations being properly done.

- b Additional Points in Planning the Fruit Program. In addition to the general considerations discussed above, there are certain special problems in planning a fruit-growing program for resettlement farms.

I Tree Fruits. Determine on what units, if any, tree fruits should be planted. It may be possible to grow tree fruits on all units in a project, but advisable on only a few. Decision should be based on such factors as:

A More favorable sites on some units than on others,

B Adaptability of clients to fruit growing,

C Distance between units, condition of roads, and the cooperative spirit of the clients, as these factors may affect the cost and effectiveness of a community spraying arrangement.

II Small Fruits. Berries and grapes of various kinds may be grown with less difficulty than certain of the tree fruits in some localities. They add variety and length of season where tree fruits are grown, and may be expanded (with canning) to largely meet the fruit requirements in the diet, where tree fruits are not feasible.

Limited quantities of berries of various kinds often find ready sale on local markets and at roadside, in areas which may or may not be able to compete with success in shipping to large markets. They are better adapted as a small-scale cash crop than are tree fruits.

III Nursery Stock. It is important to secure from a reliable nursery, strong, vigorous well-graded trees or plants, free from serious insect and disease pests. Advantage should be taken of the two principal safeguards against diseased and otherwise inferior nursery stock. These are:

A Inspection and certification which is provided by many states. This generally covers only freedom from injurious insects and diseases,

B The reliability of the nursery farm, and its reputation for furnishing high grade stock. Prices should be obtained, and orders placed, on the basis of nursery stock of definite grade (i.e. age and size).

IV Cultural Practices. Supervision of cultural practices, mentioned under Section a VIII above, is of particular importance in connection

with fruits. Proper planting, pruning, cultivation and other care is necessary from the very start if satisfactory results are to be obtained from fruit plantings. Regular attention is necessary year after year in order to prevent trees, vines and bushes from becoming tangled masses of relatively unproductive wood. The attention required by a home fruit planting is not burdensome if properly planned and regularly given.

(See Farmers' Bulletins Nos. 1001 "Growing Fruit for Home Use", 1242 "Permanent Fruit and Vegetable Gardens", and other publications of the U. S. Dept. of Agri. relating to specific fruits and specific regions, also bulletins from the state agricultural colleges on fruit growing.)

- c Additional Points in Planning the Vegetable Program. Most of the important points in the vegetable-growing program have been covered in the general discussion, section 3a. Other considerations follow.

I Planning the Supply of Vegetable Plants.

A Importance of Good Plants. Good sturdy plants are of great importance in obtaining satisfactory yields of vegetable crops, especially where transplanting is involved, such as tomatoes, cabbage, celery, peppers, egg plant, et . Definite plans must be made for an adequate supply of good plants for home garden planting and for any commercial vegetable crops planned for the project, for which plants are used instead of planting seeds in the open ground.

B Requirements for plants for transplanting are:

- (1) They must be grown from good seed of adapted varieties.
- (2) They must be as free as possible from diseases and insect pests.
- (3) They must be sturdy and stocky in type of growth and grown at the proper temperature.
- (4) They must be ready for setting out in the garden at the right time.

C Factors involved in growing good plants.

- (1) Proper equipment. This may comprise one or two simple items, such as cloth to cover an open plant bed, or a more expensive layout, including glass-covered hotbeds, cold frames or sash houses, cloth-covered cold frames, heating facilities, water supply, etc., according to the climate, kinds of plants to be grown, and time the plants will be needed.

- (2) Proper supplies. A universal requisite is good seed. Other items may be formalin or other soil disinfecting material, seed treatment materials, sprays or dusts, fuel or manure for heating hotbeds or sash houses.
- (3) Skillful management. Success in plant growing, especially under glass, requires two things of the grower:
 - (a) A thorough knowledge of the requirements of the plants as to seed-bed soil, temperature, moisture, protection from insects and diseases, time required from seeding to transplanting, and from transplanting to setting out, and other details.
 - (b) Careful attention to every detail in producing the plants, from the preparation of the seed-bed until the well-grown plants are ready to set out.

D Suggested alternative means of providing a supply of vegetable plants.

- (1) Have each farmer grow such plants as he needs. This is feasible where the farmers are familiar with and experienced in the growing of the plants they require, and where the equipment and labor required are not excessive for the number of plants needed.
- (2) Have plants grown by several farmers for all units in the project. This plan is adapted where plant-growing is relatively difficult (as in starting plants under glass) and not well understood by most of the clients, where the cost of equipment makes it economical to operate larger plant-growing units, and where the nature of the farm management plans makes it desirable to simplify the garden work as much as possible. A few skilled growers will produce better plants, and of more uniform quality, than will a large number of farmers, each growing his own.
- (3) Plant-growing may be concentrated on one unit of the project. This plan should be more efficient under many conditions than having several plant-growing layouts. It is important to take every precaution against possible failures of either equipment or men, when all of the vegetable plants for an entire project are concentrated in one place and under one management.
- (4) Plants may be purchased, ready to set out. This plan has the advantage of convenience, and is especially adapted where the farm management plans are complicated and the labor load rather heavy for the farm families. It may or may not cost more to buy plants than to raise them, depend-

ing upon local conditions.

The chief consideration in the purchase of plants is whether the farmers can depend on getting enough good plants of the kind they want, when they want them, and at a reasonable price.

II Growing or Saving Vegetable Seeds.

A Home Seed-saving. In saving garden seeds for home use, the following points should be observed.

- (1) Save only well matured seeds of varieties and strains which have yielded a satisfactory quantity and quality of produce.
- (2) Select seeds only from plants that are free from serious transmissible diseases, and of normal type and productivity for the variety.
- (3) Separate, clean, dry and store all seeds in such manner as to preserve their vitality.
- (4) Treat seeds as recommended by agricultural authorities for insects or diseases which are seed-borne, and which are likely to cause losses.
- (5) Test seeds for germination before planting.

B Commercial Seed-growing. The growing of vegetable seeds as a commercial crop is a highly specialized job involving many details, and should not be undertaken by the average farmer.

Some projects may be located in areas where certain seeds are grown commercially. In such cases, the more experienced and careful farmers on the project might grow such seeds as a cash crop.

4 SUGGESTED SOURCES OF INFORMATION.

After having recognized the problems involved and after having defined the objectives to be reached, the formulation of detailed plans which are practical and workable involves the combining of carefully selected data from various sources. The limits of applicability of the information from various sources must be recognized in the light of local conditions. Following are several sources of data which are most likely to be dependable and up-to-date.

- a County agricultural agents and extension specialists, and other state college and experiment station staff members. In regard to special fruit and vegetable problems, specialists in soils, entomology, pathology, agricultural economics and agricultural engineering and other related sciences may well be consulted, as well as the specialists in fruit and vegetable growing.

- b Bulletins and other publications from the department of horticulture and other departments of the state college of agriculture.
- c Bulletins, circulars, yearbook and other publications from the various bureaus of the United States Department of Agriculture. (Miscellaneous Publication No. 60 "List of Available Publications of the United States Department of Agriculture" has been revised as of January, 1937. This list should be on file in all project offices.)
- d United States Census reports.
- e Reports of the United States Tariff Commission.
- f Practices of successful farmers in the vicinity of the project.

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